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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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chicago.patents@klgates.com

## Office Action Summary

Application No.

10/597,402

Applicant(s)

WINDHAB ET AL.

Examiner

STEVEN LEFF

Art Unit

1782

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 6/14/11.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 14-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
- Claims 1-6, 8, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fels et al. (5345781) in view of Goavec (5024066).

Fels et al. teach a low temperature (col. 9 lines 19-21) extrusion process (col. 8 lines 62-66, col. 11 lines 18-22) for energy optimized (col. 8 lines 56-57), viscosity adapted (col. 8 lines 66-68) micro-structuring (col. 4 lines 27-34) of frozen aerated masses (col. 5 lines 50-51). More specifically with respect to claim 1, Fels et al. teach providing a mechanical treatment (col. 8 lines 56-57) of a partially frozen (col. 11 lines 11-14), aerated mass (col. 11 lines 1-4, col. 11 line 20 “foam”) over a length of an extruder screw channel zone (col. 11 lines 18-22), by locally, in the instant case with respect to the final process step (col. 12 lines 3-5, fig. 3 ref. 3) adjusting a rotational screw speed (col. 11 lines 40-42) of an extruder screw (col. 7 lines 51-55), locally adjusting a mass flow rate of a partially frozen, aerated mass at an extruder inlet (col. 12 lines 48-50) under positive replacement at the extruder inlet (col. 11 lines 10-14), and locally adjusting (fig. 3 ref. 3) a cooling temperature (col. 10 lines 5-6) at an inner wall of

the extruder housing, by adjusting an evaporation pressure of refrigerant (col. 9 lines 24-27) with respect to its local viscosity (col. 7 lines 51-55, fig. 3 ref. 3), performed such that, in each of a subsequent zone, i.e. the last stage (col. 12 lines 3-7) there is a dispersing of air bubbles/air cells (col. 4 lines 31-34, col. 4 lines 52-53) and at a same time a temperature decrease (col. 4 lines 22-25) and related increase of the frozen water fraction is achieved (col. 4 lines 26-28).

However with respect to claim 1, Fels et al. is silent with respect to adjusting the mass flow rate by a positive replacement pump installed at an extruder inlet and the cooling temperature at an inner wall of the extruder housing adjusted by an evaporation pressure of refrigerant used for a given extruder screw geometry (col. 9 lines 23-26), regulated in such a way, that for normal ice cream (col. 9 line 21) a mass temperature of below or equal to  $-11^{\circ}\text{C}$ . is achieved (col. 9 line 20) or more generally a frozen water mass fractions of ca. greater than or equal to 60% related to the total freezable water fraction are achieved within a first 50-75% of a length of the extruder measured from the extruder inlet.

Goavec teaches a system for aerating ice cream ingredients and feeding the ingredients for finally freezing the mixture such that freezing takes place in the shape of small crystals of the water contained in the mixture (col. 2 lines 59-63). Goavec further teaches providing the mixture to an inlet of an extruder using a volumetric pump whose output is constantly measured by a flow sensor (col. 2 lines 15-16) for directly transferring flow information to a computer for optimal control of freezing conditions corresponding to a predetermined desired output (col. 3 lines 44-48).

Thus since Fels et al. teach drawing the prefrozen aerated ice cream into the extruding freezer via a pipe (col. 11 lines 10-11), in addition to providing a sensor for measuring the pressure of the inlet pipe feeding the freezing chamber (col. 11 lines 39-40), since the flow of gas for aerating to a predetermined degree is relative to the final characteristic mass or amount of ice cream (col. 3 lines 59-62; Goavec), and since a positive replacement pump at the inlet of an extruder in the system as taught by Goavec can be constantly measured by a flow sensor (col. 2 lines 14-15) to achieve a finally aerated product at the exit of the freezing system corresponding to a predetermined final output (col. 4 lines 1-4) as desired by Fels et al. One of ordinary skill in the art would have been motivated to combine the teachings for the purpose of further optimizing

controllable parameters of the finally aerated and frozen product (Fels et al. col. 5 lines 50-55) including parameters relative to freezing speed and simultaneous aerating as desired by Fels et al. (col. 5 lines 50-55) since Goavec teaches that a positive replacement pump output can be constantly measured (col. 2 lines 15-16) which would provide the additional advantage of real time adjustment of the gas relative the predetermined amount of air to be combined (col. 5 lines 52-55; Fels et al., col 3 lines 57-63; Goavec).

Therefore since Fels et al. teach a method optimally controlling parameters which effect achieving a finally desired aerated ice cream product (col. 9 lines 1-25) and since the input of product affects the volumetric flow of gas needed to achieve the finally desired product, it would have been obvious to one of ordinary skill in the art to teach providing a positive replacement pump at the inlet as taught by Goavec since a positive replacement pump and sensor associated (col. 2 lines 15-16) therewith would provide the computer direct flow measurements such that the aerating can be optimally adjusted relative to the mass being provided by the pump as further taught by Goavec (col. 3 lines 55-63) thus further optimizing tailoring of mechanical energy input (col. 8 lines 56-61; Fels et al.) such that energy usage in achieving the product is optimized (col. 4 lines 50-55).

With respect to claims 2-4, Fels et al. teach a characteristic length of the zones, i.e the screw channel, into which the extruder is divided (col. 7 lines 6-10, col. 8 lines 17-22) with respect to an adaptation of a mechanical energy input for ongoing dispersing of air bubbles/air cells and synchronously decreasing temperature or increase of frozen water being one to tenfold of the outer screw diameter (col. 8 lines 17-22). Specifically with respect to a characteristic length of the zones relative to an outer screw diameter, where Fels et al. teach a screw diameter length (width) of each screw channel relative to a diameter (height) of the outer screw, represented by

$$H/W=.1,$$

Fels et al. teach a desired ratio relative to the two variables as claimed. Thus, given the desired ratio of .1, and in the instance that the length (W) is taken as 2, a proportional screw diameter (H), would be represented by the equation

$$.1=H/2, \text{ where } H=.2.$$

Therefore, with respect applicants claimed ratio of length to outer screw diameter, Fels et al. teach  $.1(W) = H$ , and in the instant case where W is taken as 2 with

respect to a constant length with respect to claim 3 (fig. 5 and 8), Fels et al. teach a ratio of 2:2 or a characteristic length being tenfold ( $2/2=10$ ) to the outer screw diameter.

With respect to claim 4 Fels et al. teach the characteristic zone length being adapted to the local change of the mass viscosity, where Fels et al. teach a the precise selection of the screw channels length and height being established under consideration of the flow function for the product at the corresponding temperature (col. 7 lines 12-24).

With respect to claim 6, Fels et al. teaches an adjustment of a mechanical mass treatment with respect to viscosity (col. 6 lines 41-42) by an adapted variation of the screw channel height (col. 7 lines 4-9), or with respect to claim 8 by an adapted variation of a screw angle (col. 7 lines 9-14).

With respect to claim 11, Fels et al. teach an increasing temperature reduction and increasing frozen water fraction along the extruder length due to optimized heat transfer to an evaporating refrigerant (col. 9 lines 25-27) contacting an outer wall of an extruder housing (col. 8 lines 40-48) by minimizing a leakage gap width between an outer screw flight diameter and an inner extrusion housing diameter (col. 8 lines 53-56). More specifically with respect to claims 12 and 13, generating a flow pattern at an outer front end of a screw flight (fig. 8, with reference to area  $\Theta$ ), which is smaller than a leakage gap (the area between the inner wall and screw flight) which leads to a reduction of the frozen material wall layer thickness not being wiped off the screw flight(s) or with respect to claim 13, not wiped from the inner wall by the screw flights, by adjusting the profile of the screw flight front edge such that it is incline to an inner barrel (fig. 8,  $\Theta$ ) or rounded with a well defined radius (col. 13 lines 1-5, fig. 8) thus providing, since the screw profile scrapes the inner surface (col. 13 lines 1-5) a flow pattern, at the points the screw scrapes the inner surface which is smaller than a leakage gap.

Fels et al. further teaches the cooling temperature at an inner wall of the extruder housing adjusted by an evaporation pressure of refrigerant used for a given extruder screw geometry (col. 9 lines 23-26), regulated in such a way, that for normal ice cream (col. 9 line 21) a mass temperature of below or equal to  $-11^{\circ}\text{C}$ . is achieved (col. 9 line 20).

With respect to claim 5, though Fels et al. is silent regulating the freezing speed in such a way, that for conventional vanilla ice cream a mass temperature of below or equal to  $-11^{\circ}\text{C}$ . is achieved or more generally a frozen water mass fractions of about

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greater than or equal to 60% related to the total freezable water fraction are achieved within a first 50-75% of a length of the extruder measured from the extruder inlet, Fels et al. does teach that the process is regulated in such a way, that for normal ice cream (col. 9 line 21) a mass temperature of below or equal to  $-11^{\circ}\text{C}$ . is achieved (col. 9 line 20) by adapting process parameters of the rotational screw speed (col. 9 lines 2-10), and adjusting cooling of the inner wall of the extruder housing as a result of evaporation of refrigerant used (col. 9 lines 23-26). Therefore it would have been obvious to one of ordinary skill in the art to teach regulating these parameters such that a mass temperature of below or equal to  $-11^{\circ}\text{C}$ . is achieved (col. 9 line 20) or more generally a frozen water mass fractions of ca. greater than or equal to 60% related to the total freezable water fraction are achieved within a first 50-75% of a length of the extruder measured from the extruder inlet thus achieving a quality aerated and frozen end product (col. 6 lines 61-66) under condition which provide reduction in processing costs as a result of optimized tailoring of mechanical energy input (col. 8 lines 56-61; Fels et al.) as a result of energy being optimized according to the flow behavior of the substance being treated and simultaneously achieving the desired quality such as with respect to different foods as taught by Fels et al. (col. 4 lines 60-65).

In addition though Fels et al is silent to teaching conventional vanilla ice cream, Fels et al. does specifically teach selection of screw geometry and speeds for optimal treatment of normal ice cream (col. 9 lines 21). Thus it would have been obvious to one of ordinary skill in the art to teach vanilla ice cream since Fels et al. teach providing optimized tailoring of mechanical energy input (col. 8 lines 56-61; Fels et al.) as a result of energy being optimized according to the flow behavior of the substance being treated and simultaneously achieving the desired quality such as with respect to different foods as taught by Fels et al. (col. 4 lines 60-65) including normal ice cream (col. 9 line 21) or in the instant case with respect to conventional standard ice cream.

- Claims 7, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fels et al. (5345781) in view of Goavec (5024066) as applied above and in further view of Capelle (5221504).

Fels et al. and Goavec are taken as above however are silent with respect to claim 7, to teaching that the adjustment relative to the viscosity of the mass in the extruder is an

adapted variation of the number of screws, or with respect to claim 9 width variation of cuts in a screw flight, or with respect to claim 10 providing adjusted pins fixed at an inner extruder barrel wall in such a way that they intermesh with cuts in the screw flights.

Capelle teach a process and apparatus for optimal operation of a high speed extruder by combining two known mixing technologies (col. 1 lines 60-65). More specifically Capelle teaches providing a barrel zone comprising adjusted pins (col. 2 lines 49-57) fixed at an inner extruder barrel wall in such a way that they intermesh with cuts in the screw flights (col. 2 lines 55-57), providing width variation of cuts in a screw flight (col. 2 lines 64-67), and adapting these variations by changing the number of screws in a related extruder zone (col. 3 lines 43-46) such that the ratio between cost and mixing quality (col. 3 lines 40-42) is energy optimized thus providing a decrease in power costs (col. 2 lines 1-6).

Thus since both Fels et al. and Capelle teach energy optimized extrusion, and more specifically since Fels et al. teaches simultaneous freezing and mixing, and altering the screw channels relative to the flow behavior of the substance being treated (col. 6 lines 62-65) such that mixing and freezing is achieved with low consumption of energy or fuel (col. 4 lines 60-63). One of ordinary skill in the art at would have been motivated to combine the teachings for the purpose of combining two know technologies to achieve optimum mixing as taught by Capelle (col. 1 lines 65-64) as a result of choosing screw geometry (Capelle; col. 3 lines 3-4) specifically according to a finally desired product consistency (Fels et al. col. 9 lines 1-14) which provides reduction in processing costs (Capelle; col. 2 lines 1-6) as a result of optimized tailoring of mechanical energy input (col. 8 lines 56-61; Fels et al.) such that the ratio between cost and mixing quality (col. 3 lines 40-42) is energy optimized thus providing a decrease in power costs (col. 2 lines 1-6).

Thus with respect to claim 7, though Fels et al. is silent to changing the number of screws in a zone relative to a viscosity of a product which is to be passed there through, Fels et al. does teach designing the geometry of the screw channels under consideration of the energy dissipation due to shearing of the product (col. 8 lines 10-16). Thus since changing the size of the screw channels, changes the number of screws relative to a currently unclaimed length as is taught by Capelle (col. 3 lines 43-46), it would have been obvious to one of ordinary skill in the art at the time of invention by



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applicant to change the number of screws for the purpose of achieving a target product consistency and optimum tailoring or mechanical energy input (col. 9 lines 1-14) as desired and taught by Fels et al. and Capelle (col. 2 lines 1-6) such that an optimal ratio of cost and mix quality is achieved (Capelle; col. 3 lines 39-40) such that foods can be produced in a simpler manner with low consumption of energy and fuel as desired by Fels et al. (col. 4 lines 60-64).

With respect to claim 9, Fels et al. does teach designing the geometry of the screw channels under consideration of the energy dissipation due to shearing of the product (col. 8 lines 10-16) and since Capelle teaches changing the width of the cuts as a result of changing the depth of the cuts (col. 2 lines 64-68) and since changing the width of cuts in a screw flight, changes the number of screws relative to a currently unclaimed length as is taught by Capelle (col. 3 lines 43-46). It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to adapt the width variation of cuts relative to the product being process for the purpose of achieving a target product consistency and optimum tailoring or mechanical energy input (col. 9 lines 1-14) as desired and taught by Fels et al. and Capelle (col. 2 lines 1-6) such that an optimal ratio of cost and mix quality is achieved (Capelle; col. 3 lines 39-40) such that foods can be produced in a simpler manner with low consumption of energy and fuel as desired by Fels et al. (col. 4 lines 60-64).

With respect to claim 10, Fels et al. does teach designing the geometry of the screw channels under consideration of the energy dissipation due to shearing of the product (col. 8 lines 10-16). Thus since Capelle teaches combining the pin-lined barrel extrusion technology (col. 2 lines 49-54) and other known technologies (col. 1 lines 62-63) results in a great reduction in operating costs (col. 2 lines 1-6). It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to provide a pin barrel extrusion zone such that the pins intermesh with the screw flights as taught by Capelle (col. 2 lines 54-56) for the purpose of achieving a target product consistency and optimum tailoring or mechanical energy input (col. 9 lines 1-14) as desired and taught by Fels et al. and Capelle (col. 2 lines 1-6) such that an optimal ratio of cost and mix quality is achieved (Capelle; col. 3 lines 39-40) such that foods can be produced in a simpler manner with low consumption of energy and fuel as desired by Fels et al. (col. 4 lines 60-64) since combining the pin-lined barrel extrusion technology (col. 2 lines 49-

54) and other known technologies (col. 1 lines 62-63) results in a great reduction in operating costs (col. 2 lines 1-6).

### ***Response to Arguments***

With respect to applicant's urgings that Fels et al. is silent to local adjustment of various parameters, since applicant urges that Fels et al. teaches homogenous mixing. It is initially noted that claim 1 does not require multiple adjustments over the length of an extruder screw channel, merely a local adjustment. Thus in the instant case, where Fels et al. teaches individual adjustments with respect to multiple areas, and in the instant case with respect to the defined freezing area, reference # 3 of figure 3, which is individually controlled with respect to rotational screw speed, flow rate, and cooling temperature (col. 12 lines 8-24), Fels et al. teaches applicants claimed "locally adjusting". Thus, with respect to the final process step (col. 12 lines 3-5, fig. 3 ref. 3) and applicants claim 1, locally adjusting a rotational screw speed (col. 11 lines 40-42) of an extruder screw (col. 7 lines 51-55), locally adjusting a mass flow rate of a partially frozen, aerated mass at an extruder inlet (col. 12 lines 48-50) under positive replacement at the extruder inlet (col. 11 lines 10-14), and locally adjusting (fig. 3 ref. 3) a cooling temperature (col. 10 lines 5-6) at an inner wall of the extruder housing, by adjusting an evaporation pressure of refrigerant (col. 9 lines 24-27) with respect to its local viscosity (col. 7 lines 51-55, fig. 3 ref. 3), performed such that, in each of a subsequent zone, i.e. the last stage (col. 12 lines 3-7) there is a dispersing of air bubbles/air cells (col. 4 lines 31-34, col. 4 lines 52-53) and at a same time a temperature decrease (col. 4 lines 22-25) and related increase of the frozen water fraction is achieved (col. 4 lines 26-28).

With respect to applicants urgings that Govaec and Capelle are silent to teaching local adjustments it is initially noted, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Rather the reference teaches a certain concept, specifically Govaec teaches that a positive replacement pump output can be constantly measured (col. 2 lines 15-16) where Fels et al. teach drawing the prefrozen aerated ice cream into the extruding freezer via a pipe (col. 11 lines 10-11), in addition to providing a sensor for measuring the pressure of the inlet pipe feeding the freezing chamber (col. 11 lines 39-40), since the flow of gas for aerating to a predetermined degree is relative to the final characteristic mass or amount of ice cream (col. 3 lines 59-62; Govaec), thus providing the additional advantage of real time adjustment of the gas relative the predetermined amount of air to be combined for a desired consistency (col. 5 lines 52-55;

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Fels et al., col 3 lines 57-63; Goavec), and in combination with the primary reference, discloses the presently claimed invention.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Leff whose telephone number is (571) 272-6527. The examiner can normally be reached on Mon-Fri 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached at (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Drew E Becker/

Primary Examiner, Art Unit 1782

/Steven Leff/

Examiner, Art Unit 1782